Research Department
Federal Reserve
Bank of
San Francisco

August 5, 1983

FRBSF Weekly Letter

Money, Inflation, and Interest Rates

From July 1982 to June 1983, the stock of money (measured by M1) increased at an annual rate of 14 percent. Clearly, such a high rate of monetary expansion sustained indefinitely would not be compatible with stable prices, or even with the 4-5 percent inflation we have been observing in the last twelve months.

To illustrate this point, consider the following example. The Administration has set a target for annual growth in real GNP of four percent over the next five years. To achieve this target, total spending would have to grow at a rate sufficient to absorb the dollar value of this increase in the nation's output. Allowing for inflation, annual spending growth would have to be limited to the four percent growth in output plus the rise in prices—to around nine percent, in other words, if inflation were not to rise above recent levels. If money's velocity—the speed with which it circulates—did not change, spending growth of nine percent would require an equal growth in the stock of money. Over most of the postwar period, however, the velocity of money has tended to rise steadily. Although this upward trend was interrupted in 1982, I shall argue that the interruption probably does not represent a permanent change in the trend. Hence, the growth in money necessary to sustain a nine percent rate of growth in spending is likely to be less than nine percent. Fourteen percent money growth on a sustained basis, therefore, is almost certainly not the prescription for further reductions in the inflation rate.

The dramatic and unexpected slowing in the rate of inflation in 1982 had the dual effect of keeping real interest rates high and the real economy depressed. In this *Letter*, I shall review the interaction of money, inflation, and interest rates. I will argue that the Federal Reserve took appropriate countervailing action in mid-1982 when it sharply increased the stock of money but that the necessary correction in the level of the money stock is now largely complete.

Inflation and the goods markets

Monetary theory predicts that changes in the growth rate of money will lead to changes in the growth rate of total spending in the economy and hence of nominal GNP. Both theory and empirical evidence suggest that in the *short run* such changes in the growth rate of spending mainly take the form of variations in the rate of *real growth*, but that in the *long run*, they appear largely in the form of changes in the *inflation rate*. The Federal Reserve relied on the latter relationship between money and prices when it set out to reduce inflation by slowing the rate of monetary growth in stages over a number of years.

The expected outcome of lower inflation ultimately materialized. What surprised economists and policymakers alike was the suddenness of the inflation slowdown. In the first six months of 1982, consumer prices increased at an annual rate of only five percent—sharply lower than the 7.4 percent inflation rate in the second half of 1981—and this deceleration of inflation continued in the second half of 1982 and into 1983. In the first five months of 1983, prices rose at an annual rate of less than three percent.

When the prices of goods and services are rising rapidly, both households and businesses have an incentive to buy now rather than later when prices will be higher. The extreme example of this phenomenon is the "flight from the currency" which occurs during hyperinflations. By the same token, a reduction in the rate of inflation creates an incentive to delay spending decisions. If this tendency is not offset by a reduction in nominal or market interest rates, it will have a contractionary effect on the economy.

Put differently, a decrease in the inflation rate, to the extent that it lowers expectations

Research Department
Federal Reserve
Bank of
San Francisco

of future inflation, implies an increase in the real rate of interest as long as nominal rates do not change. Higher real interest rates encourage households to save more at the same time as they discourage businesses from undertaking new investment projects. As a result, the aggregate demand for goods and services declines.

As pointed out above, in the early months of 1982, we saw just such a slowing in the rate of inflation. At the same time, nominal interest rates rose slightly so that real interest rates also rose. This would be expected to contract aggregate demand and, in fact, that is what happened. As a result, the recession that started in 1981 lasted longer than most economists had predicted. Instead of being a year of recovery, 1982 was one in which unemployment rose steadily to its highest rate since 1940.

Inflation and the demand for money

A decline in the rate of inflation reduces the differential between real and nominal interest rates (the differential being equal to the expected inflation rate). As pointed out above, economists generally take it for granted that the demand for goods and services responds to the real rate; they argue that savers are concerned with the *real* return on their savings rather than the nominal return and that investors pay attention to real costs and real returns when planning capital investment projects. This means that when the inflation rate comes down, the nominal rate must decline correspondingly if real aggregate demand is to be maintained.

Such a decline in the nominal rate will increase the public's demand for money because that demand depends on the opportunity cost of holding money which is represented by the *nominal* interest rate. Thus, to avoid a decline in the levels of output and employment when the inflation rate slows down, the level of the public's aggregate holdings of money must be increased to meet the increased demand. If this is not done, nominal interest rates will not decline, real rates will rise and output and employment will fall. But raising the *level* of the public's money holdings requires that the *growth* in money *temporarily* rise in order to accommodate the increased demand to hold it.

To prevent the resurgence of inflationary expectations, the Federal Reserve must make it clear that this temporary burst of monetary expansion represents a "level adjustment" to the higher demand for money and not a permanent increase in the money growth rate that would ultimately lead to higher inflation. Clearly, once the adjustment in the level of money holdings has been made, the growth in money must revert to the lower rate that is consistent with the lower rate of inflation.

In the wake of the inflation slowdown

In July 1982, the monetary growth rate increased sharply and nominal interest rates fell rapidly. Money growth continued high into the fall of 1982 and early 1983 as the public adjusted its demand for money to the lower interest rates and also to the rise in their incomes as the economy began to revive. At that time, it was argued that this increase in the stock of money resulted from greater uncertainties in the economy that had increased the precautionary demand for money. Evidence developed at this Bank, however, suggests that the rapid money growth during this period was no greater than the rise in income and the earlier decline in short-term interest rates would have led us to expect. That is, empirically estimated money demand functions fit the data of this period quite well. This evidence also suggests that earlier fears that the introduction of interest-bearing checking accounts (Super-NOWs) in 1983 would cause the demand for money function to become unstable were, apparently, not realized.

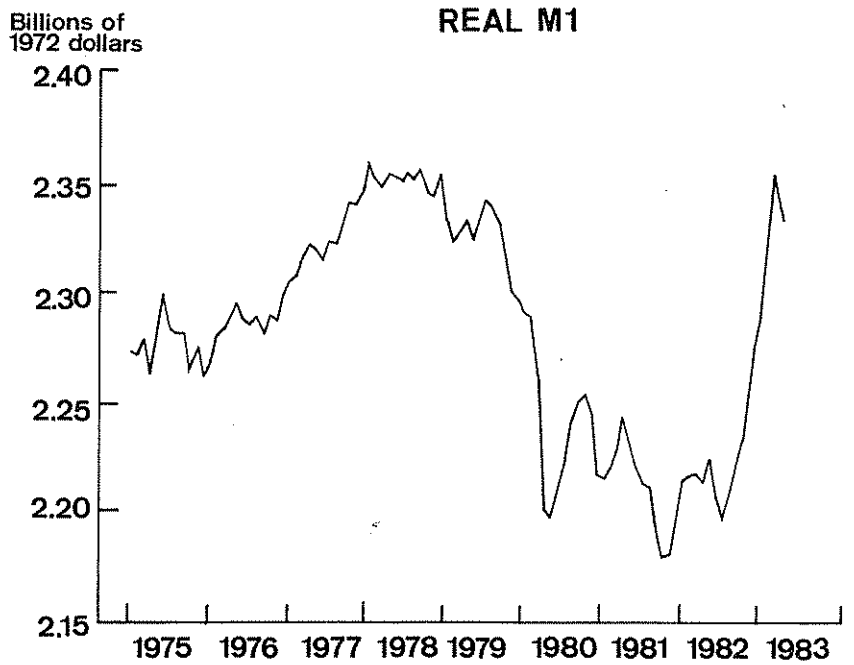
We can, therefore, conclude that the rapid growth of money since July 1982 represents a necessary upward adjustment in the level of the money stock. This adjustment was

required to permit nominal interest rates to fall to a level consistent with the slower rate of inflation. As such, it is not inflationary because the money is being willingly held by the public at lower nominal interest rates. Indeed, if the Federal Reserve had not increased the stock of money as the inflation rate came down, real interest rates would have been higher and the economy significantly weaker.

This does not mean that it would be appropriate now to continue to allow money to grow rapidly. A temporary increase in the rate of money growth is an appropriate way of adjusting the *level* of money balances to the reduction in nominal interest rates made necessary by the slowing of inflation. It is not, however, a viable long-term strategy because it leads to inflation in the long run. As the accompanying chart illustrates, the level of real money balances in dollars of constant purchasing power is now approximately back to its previous peak level, reached five years ago. This strongly suggests that much of the adjustment to the level of the money stock is now complete.

For the future, sustained real growth without the re-emergence of rapid inflation requires nominal M1 growth well below the rates experienced since last July. Ultimately, this growth must be brought down to lower levels if inflation is not to be re-ignited.

Brian Motley



FRBSF Weekly Letter

FIRST CLASS

Research Department
Federal Reserve
Bank of
San Francisco
Alaska • Arizona • California • Hawaii
Idaho • Nevada • Oregon • Utah • Washington

FIRST CLASS MAIL
U.S. POSTAGE PAID
PERMIT NO. 752
San Francisco, Calif.

BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 7/20/83	Change from 7/13/83	Change from year ago Dollar	Change from year ago Percent
Loans (gross, adjusted) and investments*	162,123	− 82	938	0.6
Loans (gross, adjusted) — total#	140,923	164	420	0.3
Commercial and industrial	43,870	− 62	− 176	− 0.4
Real estate	56,179	56	− 1,263	− 2.2
Loans to individuals	24,000	56	651	2.8
Securities loans	2,410	− 94	− 313	− 11.5
U.S. Treasury securities*	8,192	− 200	1,551	23.4
Other securities*	13,007	− 46	− 1,033	− 7.4
Demand deposits — total#	40,980	− 953	2,071	5.3
Demand deposits — adjusted	28,614	−1,884	1,649	6.1
Savings deposits — total†	66,512	− 281	35,891	117.2
Time deposits — total#	65,573	50	− 34,046	− 34.2
Individuals, part. & corp.	59,911	125	− 30,109	− 33.4
(Large negotiable CD's)	18,582	− 330	− 19,258	− 50.9

Weekly Averages of Daily Figures	Week ended 7/20/83	Week ended 7/13/83	Comparable year-ago period
Member Bank Reserve Position			
Excess Reserves (+)/Deficiency (−)	97	122	33
Borrowings	114	163	7
Net free reserves (+)/Net borrowed(−)	− 17	− 42	26

* Excludes trading account securities.
# Includes items not shown separately.
† Includes Money Market Deposit Accounts, Super-NOW accounts, and NOW accounts.

Editorial comments may be addressed to the editor (Gregory Tong) or to the author . . . . Free copies of this and other Federal Reserve publications can be obtained by calling or writing the Public Information Section, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco 94120. Phone (415) 974-2246.